Proposed Operator Actions for In-Station Diagnostic Alarms
for Healy Phase II System with Veeder-Root In-Station Diagnostics
July 22, 2008

Due to the recent concerns raised by the California Air Pollution Control Officers Association Vapor Recovery Committee and other stakeholders regarding interpretation of in-station diagnostics (ISD) requirements of alarms, the difference between "warning" and "failure" ISD alarms, and what to do in response to the alarms. California Air Resources Board (ARB) staff have drafted definitions to clarify the differences between the alarms and prepared a table that provides guidance to gasoline dispensing station operators in response to ISD assessment alarms. The following is a draft of proposed definitions of various ISD alarms, including Table 1 which illustrates various alarms and actions to be taken in response to those alarms.

ARB will be accepting comments through August 15, 2008.

If you have questions or need further information, please contact Vince Bunac at (916) 327-7420 or via email at vbunac@arb.ca.gov.

ISD Alarm Protocol: Proposed Operator Responses to Alarms of the Veeder-Root In-Station Diagnostic System for the Healy Enhanced Vapor Recovery (EVR) Phase II System

The yellow warning alarm and the red failure alarm are both used (1) as system assessment alarms and (2) as system application alarms in the Veeder-Root In-Station Diagnostic (ISD) system. Table 1 lists recommended operator response to system assessment alarms. No recommendations are provided for operator response to the system application alarms listed in Table 2 other than follow Veeder-Roots recommendations.

1. **Assessment Alarms.** The assessment alarms are the warning and failure alarms to alert the operator that the vapor recovery system is not operating within the set performance standards. When ISD performs a test for the vapor leakage rate, the tank pressure or any other parameter, and the result fails the standard listed in CP-201, ***Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities***, then an assessment alarm is posted on the Veeder-Root TLS monitor console. See the TLS Displayed Messages in the first column of Table 1.

   The Assessment Alarms are listed below:

   a. **"Warning" alarm:** A warning alarm will post the first time ISD performs a test that fails for vapor collection or containment. The warning may be for a daily, weekly or monthly assessment.[1] The assessment warning alarms include:
      A. daily average gross V/L
      B. weekly average degradation V/L,
      C. weekly average gross of UST ullage pressure,
      D. monthly average degradation of UST ullage pressure, and
      E. weekly average pressure integrity (leakage).

   b. **"Failure" alarm:** A failure alarm will post the second consecutive time ISD performs a test that fails for vapor collection or containment. ISD will then shut down dispensing at all fueling points. A failure alarm occurs after a warning alarm persists for an entire assessment period. The assessment failure alarms are the same as the warning alarms:
      A. daily average gross V/L
      B. weekly average degradation V/L,
      C. weekly average gross of UST ullage pressure,
      D. monthly average degradation of UST ullage pressure, and
      E. weekly average pressure integrity (leakage).

   Table 1 lists and explains each assessment alarm and provides the recommended operator response and troubleshooting suggestions

2. **System Application Alarms** System application alarms indicate erroneous setup or malfunction of ISD equipment or the underground storage tank (UST) leak monitor, rather than failure of the vapor recovery system. System application alarms may be activated by the fuel management system or the secondary containment monitoring system, in addition to the vapor recovery monitoring system. Instantaneous system

application alarms for vapor recovery will occur when there is a loss of communication with any component that is connected to the ISD console (TLS or TS-EMS). The first column of Table 2 lists vapor recovery system application alarms, including pressure sensor out, missing flow meter, dispenser interface module connection down, and ATG connection down. These alarms do not cause a dispenser(s) shutdown. Again note that there no recommendations for operator response are provided for system application alarms in Table 2 other than to follow Veeder-Roots recommendations.

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[1] Daily warning for a gross V/L consists of an average of sensor data collected over a 24-hour period. The time of the calculation of the daily result is either 11:59 pm (default) or is specified by the GDF operator. If insufficient data are collected and a daily result cannot be calculated, the parameter daily result may be "no test" and the assessment will not be made until a specified amount of data has been collected. The amount of data needed to make a daily assessment is specified in CP-201. As an example for gross V/L, a minimum of 15 non-ORVR (on-board refueling vapor recovery) equipped vehicles is needed to make the assessment. The V/L measurements of at least 15 vehicles must be outside the specified range.

Weekly warning for a given ISD parameter (i.e., Degradation V/L, Gross over Pressure, and Vapor Leakage Detection) consists of an average of sensor data, or other calculation depending on the ISD parameter, collected over a rolling 7-day period. If insufficient data are collected degradation V/L and a weekly result cannot be calculated, the parameter weekly result may be "no test" and the assessment will not be made until a specified amount of data has been collected. The amount of data needed to make a weekly assessment is specified in CP-201. As an example for degradation V/L, a minimum of 30 non-ORVR equipped vehicles is needed to make an assessment. The V/L for at least 30 vehicles must be outside the specified range.

Monthly warning for degradation pressure consists of an average of sensor data collected over a rolling 30-day period. The specified range needed to make the monthly assessment is specified in CP-201.

TABLE 1 – ISD ALARM PROTOCOL:
VEEDER-ROOT ISD ALARM AND OPERATOR ACTION IN RESPONSE TO ALARM

TLS Displayed Message	Printout displayed Value	ISD Monitoring Category	Indicator Light	Meaning of Indicator Light	Cause	Operator Action	Suggested Troubleshooting	Contractor Action
ISD VAPOR LEAKAGE WARN	Leak Rate In Cubic Feet Per Hour (CFH)	Containment	Yellow	Dispensing Allowed for at least 7 days	First Consecutive 7-Day Vapor Leakage Detection test warning	If the warning continues after 4 days of the original warning post (yellow), call certified technician for repair	TP-201-3	Executing (Clear Test After Repair) without making a repair or failing test is subject to district permit conditions -
ISD VAPOR LEAKAGE FAIL		Containment	Red	No Dispensing at All Fueling Points	Second Consecutive 7-Day Vapor Leakage Detection test failure	• Call certified technician for repair, • Reenabling system without repair is subject to district permit conditions		
ISD GROSS PRESSURE WARN	95th Percentile pressure in Inches of Water Column ("WC)	Containment	Yellow	Dispensing Allowed for at least 7 days	First Consecutive 7-Day Gross Over Pressure test warning	If the warning continues after 4 days of the original warning post (yellow), call certified technician for repair	Look for problems using one or more of the following VR-202 procedures/tests: Dispenser Integrity Test B-3m (i.e. "Plumbing Tightness test), Exhibit 4, Exhibit 5, Exhibit 9 (pressure sensor only) or flow rate verification per section 1.2.3	
ISD GROSS PRESSURE FAIL		Containment	Red	No Dispensing at All Fueling Points	Second Consecutive 7-Day Gross Over Pressure test failure	• Call certified technician for repair, • Reenabling system without repair is subject to district permit conditions		
ISD DEGRD PRESSURE WARN	75th Percentile Pressure in Inches of Water Column ("WC)	Containment	Yellow	Dispensing Allowed for at least 30 days	First Consecutive 30-Day Degradation Over-Pressure test warning	If the warning continues after 15 days of the original warning post (yellow), call certified technician for repair		
ISD DEGRD PRESSURE FAIL		Containment	Red	No Dispensing at All Fueling Points	Second Consecutive 30-Day Degradation Over-Pressure test failure	• Call certified technician for repair, • Reenabling system without repair is subject to district permit conditions		
Hnn: GROSS COLLECT WARN	A/L Average or BLKD	Collection	Yellow	Dispensing Allowed for at least another 24 hours	First 24 Hour Gross A/L Test warning	Monitor affected fueling point(s)	VR-202 Exhibit 5	
Hnn: GROSS COLLECT FAIL		Collection	Red	No Dispensing at All Fueling Points	Second Consecutive 24 Hour Gross A/L Test failure	• Bag affected fueling point(s) immediately after failure posts. • Call certified technician for repair, • Reenable unaffected fueling points, • Reenabling fueling point(s) without repair is subject to district permit conditions		
Hnn: DEGRD COLLECT WARN	A/L Average, or 0.00	Collection	Yellow	Dispensing Allowed for at least 7 days	First Consecutive 7-Day Degradation A/L Test warning	If the warning continues after 4 days of the original warning post (yellow), call certified technician for repair		
Hnn: DEGRD COLLECT FAIL		Collection	Red	No Dispensing at All Fueling Points	Second Consecutive 7-Day Degradation A/L Test – failure	• Bag affected fueling point (s) immediately after failure posts, • Call certified technician for repair, • Reenable unaffected fueling points, • Reenabling system without repair is subject to district permit conditions		

TABLE 2 - VEEDER-ROOT SYSTEM APPLICATION ALARMS

Displayed Message	Indicator Light	Set Condition	Clear Condition
MISSING RELAY SETUP	Red	One or more required shutdown alarms have not been assigned to a relay.	Setup required shutdown alarms.
MISSING TANK SETUP	Red	There are no vapor recovery (gasoline) tanks defined or a gasoline pump has not been assigned to a control (shut down) device in at least one tank.	Complete gasoline tank setup.
MISSING HOSE SETUP	Red	There are no product meters assigned to a hose.	Assign at least 1 product meter to a hose.
hnn: VPRFLOW MTR SETUP	Red	Incoming transaction from a hose with an unavailable Vapor Flow Meter.	Configure Vapor Flow Meter (Smart Sensor) and enable it in ISD.
MISSING VAPOR PRES SEN	Red	There is no Vapor Pressure Sensor setup or detected.	Complete Vapor Pressure Sensor setup.
MISSING VAPOR FLOW MTR	Red	There is no Vapor Flow Meter setup or detected.	Complete Vapor Flow Meter setup.
fnn: CHK VAPOR FLOW MTR	Red	Failure of volume measure test possible problem vapor flow meter.	Volume measure test passes or vapor flow meter deconfigured, or test cleared.
ISD SENSOR OUT WARN	Yellow	ISD Sensor Out Self-Test warning	module installation/communication per section 2 of the Veeder-Root Install, Setup, & Operation Manual
ISD SENSOR OUT FAIL2	Red	ISD Sensor Out Self-Test consecutive failure	
ISD SETUP WARN	Yellow	System Setup Self-Test warning	Confirm EVR/ISD programming per section 3 of the Veeder-Root Install, Setup, & Operation Manual
ISD SETUP FAIL2	Red	System Setup Self-Test failure consecutive failure	